Space Weather Forecast

Issued on Wednesday, 16 March 2022 at 12:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate Solar activity with a chance of further M-flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate over the past 24 hours with a couple of Moderate flares (R1 Radio Blackouts) observed from a sunspot in the north-centre disc. This is a wide region, consisting of a large number of small individual spots. Some development to the north of the region potentially caused instability to occur and the subsequent flare activity. The three remaining sunspot regions on the viable side of the disc remain small and simple. No Earth-directed coronal mass ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have ranged from Slow to slightly elevated. The magnetic field carried by the winds has been Weak, with the north-south directed component remaining weak and generally positive (northward) with only brief negative (southward) periods. Geomagnetic activity has been Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Low, with a chance of further Moderate flares (R1 Radio Blackouts) from the large region in the northwest of the disc.

Solar Wind / Geomagnetic Activity: There is one slow weak CME observed from the south of the Sun on 13 March. This will likely pass below Earth, but may give a glancing impact on day 2 (17th). Otherwise solar winds will probably continue to be mainly Slow. Geomagnetic activity is likely to continue generally Quiet, with the greatest chance of any significant increases in activity to Active (Kp4) if Earth experiences the incoming weak CME on Day 2 (17th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels with no solar radiation storms, although there is a slight chance of an increase in response to any larger flares that may occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	40	30	30
Very Active	R3 to R5 X	No	5	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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